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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/520,497	09/14/2005	Huazhong Shi	023070-127310US	9783

20350 7590 05/19/2008  
TOWNSEND AND TOWNSEND AND CREW, LLP  
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EXAMINER
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BUI, PHUONG T

ART UNIT	PAPER NUMBER
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1638

MAIL DATE	DELIVERY MODE
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05/19/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/520,497	<b>Applicant(s)</b> SHI ET AL.	
	<b>Examiner</b> Phuong T. Bui	<b>Art Unit</b> 1638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 15 February 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 14, 15 and 21-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 14, 15 and 21-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. The previous final rejection has been vacated. A substitute final rejection is set forth below. The Office regrets any inconvenience to Applicant.

The Office acknowledges the receipt of Applicant's amendment filed February 15, 2008. Claims 14, 15 and 21-29 are pending and are examined. All previous rejections not set forth below have been withdrawn. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action. This action is made FINAL.

#### ***Claim Rejections - 35 USC § 112, second paragraph***

2. Claims 14, 21, 22, 24-26 and 28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

These claims recite "comprising" and "fewer than 530 amino acids". It is unclear what size nucleotide sequence is being claimed as "comprising" is open language, but "fewer" sets an upper limit.

Applicant has deleted one recitation of "comprising". However, the remaining "comprising" language in the claims makes these claims indefinite for the same reason.

Clarification and/or correction are required.

#### ***Claim Rejections - 35 USC § 112, first paragraph***

3. Claims 14, 21, 22, 24-26 and 28 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for SEQ ID NO:9 and 10, does not reasonably provide enablement for 80-90% sequence identity and fewer than

530 amino acids. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims. This rejection is maintained for reasons of record.

Applicant traverses, stating Figure 6 provides sufficient guidance with regard to functional regions or domains in the AtNHX1 protein and the location of the 23 mutations as well as sites of deletion for the six truncated forms in Table 1. Applicant further states that a truncated protein in which the free N-terminal sequence was deleted provided enhanced salt tolerance, which the inventors concluded that the N-terminus is a negative regulator of function.

Applicant's traversals have been carefully considered but are deemed unpersuasive for the following reasons. Applicant's arguments are not commensurate in scope with the claims. The claims are not limited to any of the 23 mutations in Figure 6 or the 6 truncated forms of the protein in Table 1. The breadth of the claims encompasses any mutation and any deletion anywhere in the sequence encoding SEQ ID NO:2. Based upon Applicant's working examples and the data presented, no prediction can be made to determine what additional mutations and deletions would result in the salt tolerance phenotype. "Fewer than 530" amino acids is not the same scope as deleting 17 amino acids from the N-terminus of SEQ ID NO:2 as shown in Table 1. Before the plants containing different constructs can be tested for salt tolerance, one skilled in the art must be able to make these constructs without undue experimentation. Since it is highly unpredictable as to which constructs would yield a

salt tolerance phenotype for the reasons indicated above and of record, the amount of experimentation required is deemed to be excessive and undue. Accordingly, this rejection is maintained.

***Claim Rejections - 35 USC § 112, first paragraph***

4. Claims 14, 21, 22, 24-26 and 28 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the **written description** requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. This rejection is maintained for reasons of record.

Applicant traverses, stating that Applicant is not required to reduce to practice each and every species encompassed by the claims and the specification provides detailed sequence information about the AtNHX1 protein and a large number of mutants. Applicant further traverses that in *Ex parte* Bandman and *Ex parte* Sun, 95% and 80% without functional recitation, respectively, were deemed to have adequate written description.

Applicant's traversals have been carefully considered but are deemed unpersuasive for the following reasons. The specification provides no guidance as to which mutations would confer salt tolerance and which would not. Applicant states that the N-terminus is a negative regulator of function (Example 8), but Applicant does not provide an adequate written description of sequences having 80-95% sequence identity, fewer than 530 amino acids, and possessing the salt tolerance phenotype. While

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Applicant is not required to reduce to practice every claimed embodiment, one skilled in the art must be able to reliably predict the structure of the genus of sequences claimed based upon Applicant's disclosure. In the instant case, no meaningful correlation can be made between the structure claimed (what mutations) and function associated with that structure. *Ex parte* Bandman and *Ex parte* Sun are not applicable to the instant application because the facts in the instant application differ from these cases. The claims presented in Bandman and Sun lack functional recitations. While every embodiment of a genus of sequences having less than 100% sequence identity to an identified sequence can be envisaged, this would not be true for a genus of 80-95% sequence identity having a functional recitation. Claim 14 of the instant application is drawn to a genus of sequences having 80% sequence identity to SEQ ID NO:2, fewer than 530 amino acids, and confers increased salt tolerance in a plant. Applicant has not provided adequate written description for a population of sequences which would have this functional limitation from the genus of sequences having 80% sequence identity to SEQ ID NO:2. Accordingly, for these reasons and reasons of record, the claimed invention lacks adequate written description.

***Claim Rejections - 35 USC § 102***

5        Claims 14, 15 and 21-29 are rejected under 35 U.S.C. 102(b) as being anticipated by Gaxiola et al. (PNAS, Vol. 96, No. 4, pp. 1480-1485, Feb 1999). The open language in these claims reads on the full-length sequence of SEQ ID NO:2. Gaxiola teaches SEQ ID NO:2 (AtNHX1) and vector, which encompasses SEQ ID NO:9 encoding SEQ ID NO:10. Accordingly, Gaxiola anticipated the claimed invention.

Applicant indicated that the claim has been amended to include only the truncated protein.

Even though one recitation of “comprising” has been deleted, the other recitation of “comprising” allows for the addition of other bases onto the truncated sequence. Accordingly, this rejection is maintained.

***Remarks***

6. No claim is allowed.

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phuong T. Bui whose telephone number is 571-272-0793.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anne Marie Grunberg can be reached on 571-272-0975. The fax phone

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number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Phuong T. Bui/

Primary Examiner, Art Unit 1638

4/29/08